

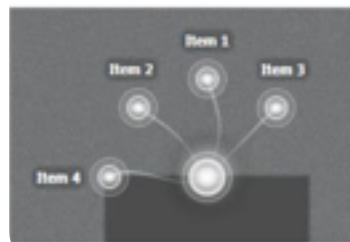
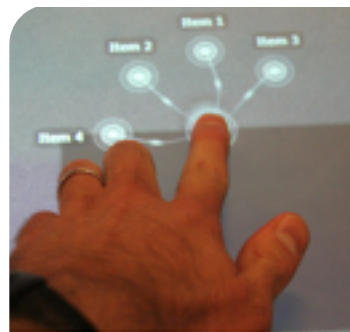
Testing Surface Applications the LEET Way

By Theodore D. Hellmann,
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While the development of applications for tablets and digital tabletops has recently become a subject of significant interest, few tools exist to help with automated testing of these applications. This means that developers can end up struggling to create surface-based tests by hand or struggling to make use of tools that aren't optimal for testing this sort of application. In such a situation, developers may simply forgo automated testing altogether at the user interface level.

LEET (LEET Enhances Exploratory Testing) is a tool for creating automated GUI tests of desktop, surface, and web applications. It works by recording a script of automatable events raised during a user's interactions with an application. This script is compiled into C# code which can be executed to replay this sequence of interactions. Since this test is compatible with Visual Studio's testing framework, it can be included as part of an automated regression suite.

LEET is based on the Windows



Automation API, which serves as an interface between test code and elements of a GUI. Because of this interface, the GUI that LEET is testing can change without breaking tests unnecessarily as long as the sequence of actions to use a feature remains the same.

Future work will enable recording

and testing of custom interactions to support testing of novel user interaction techniques. This will enable better testing of applications where user interaction is difficult to express using traditional interactions – such as with natural user interfaces.

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<http://www.nsercsurfnet.ca/pmwiki.php?n=SurfNet.Contact>

Ubiquitous Cursor: A Comparison of Direct and Indirect Pointing Feedback in Multi-Display Environments

By Robert Xiao, Miguel A. Nacenta, Regan Mandryk, Andy Cockburn and Carl Gutwin

Multi-display environments (MDEs) connect several displays into a single digital workspace. One of the main problems to be solved in an MDE's design is how to enable movement of objects from one display to another. When the real-world space between displays is modeled as part of the workspace (i.e., Mouse Ether), it becomes difficult for users to keep track of their cursors during a transition between displays.

To address this problem, we developed the Ubiquitous Cursor system, which uses a projector and a hemispherical mirror to completely cover the interior of a room with usable low-resolution pixels. Ubiquitous Cursor allows us to provide direct feedback about the location of the cursor between displays.

To assess the effectiveness of this direct-feedback approach, we carried out a study that compared Ubiquitous Cursor with two other standard approaches: Halos, which provide indirect feedback about the cursor's location; and Stitching, which warps the



cursor between displays, similar to the way that current operating systems address multiple monitors. Our study tested simple cross-display pointing tasks in an MDE; the results showed that Ubiquitous Cursor was significantly faster than both other approaches. Our work shows the feasibility and the value of providing direct feedback for cross-

display movement, and adds to our understanding of the principles underlying targeting performance in MDEs.

This work will appear at the Graphics Interface 2011 Conference in St. John's, Newfoundland from May 25 to May 27 where it will be presented the Michael A.J. Sweeney award.

SurfNet News

Best Student Paper Award

Ubiquitous Cursor: A Comparison of Direct and Indirect Pointing Feedback in Multi-Display Environments by Robert Xiao, Miguel Nacenta, Regan Mandryk, Andy Cockburn and Carl Gutwin will be presented the Michael A. Sweeney award at the upcoming [Graphics Interface Conference](#). This winning paper was selected by the program committee from among all papers accepted for the conference for which one or more student authors are presenting the paper. For further information about the Ubiquitous Cursor go to <http://www.nsercsurfnet.ca/pmwiki.php?n=SurfNet.Papers>.

Upcoming Event

Industry Open House | University of Calgary | September 1, 2011

This Open House will provide the general public the opportunity to view demos on the latest surface applications and to ask questions of our researchers and students. Registration is required. Information will be posted on our website very soon.